
PART II: Questions 11 - 20, Open ended

Answer all TEN questions. You must show all your work in a clear and logical progression and clearly indicate your answer to receive full credit.

State the domain and range of $f(x)$. Find $f^{-1}(x)$.

$$11) f(x) = \frac{3x - 2}{x + 5}$$

domain of $f(x)$: _____

range of $f(x)$: _____

$$f^{-1}(x) = \underline{\hspace{4cm}}$$

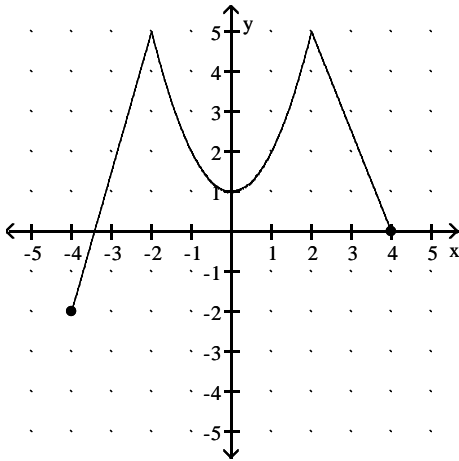
Solve the inequality.

$$12) x(x + 3)(5 - x) \geq 0$$

Use the graph of the function $f(x)$ to answer the following questions.

13)

$f(x)$



a) Find $f(-2)$

b) For what value(s) of x is $f(x) = -2$?

c) What is the domain of $f(x)$?

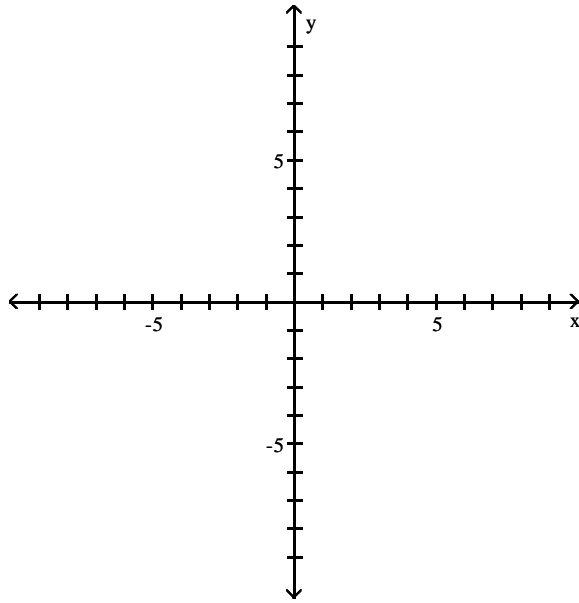
d) On what interval(s) is $f(x)$ increasing?

Write as the sum and/or difference of logs. Express powers as factors.

14) $\ln \left[\frac{(x) \sqrt[7]{1+5x}}{(x-7)^5} \right], \quad x > 7$

Graph the function. Include any asymptotes and intercepts if applicable.

$$15) f(x) = \frac{x}{x^2 - 9}$$

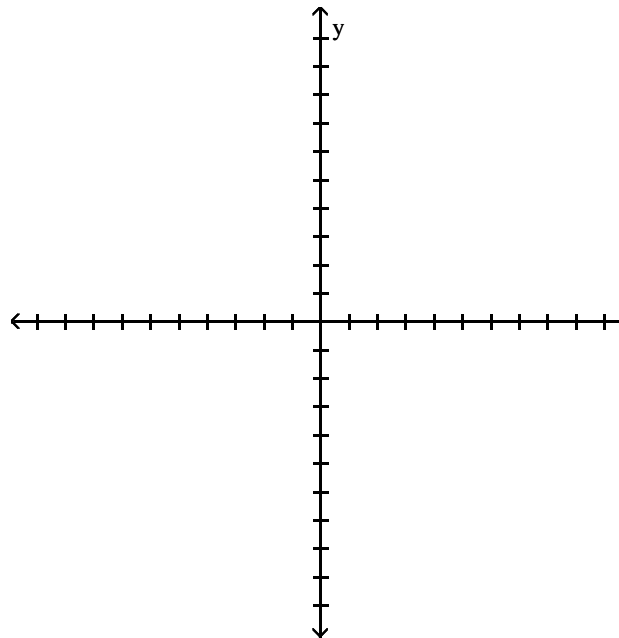


Solve the problem.

16) A wire of length $5x$ is bent into the shape of a square. Express the area A of the square as a function of x .

Write an equation for the ellipse satisfying the given conditions. Graph the ellipse.

17) Vertices at $(5, -4)$ and $(5, 8)$; length of minor axis is 6



Form a polynomial $f(x)$ with real coefficients having the given degree and zeros.

18) Degree: 3; zeros: 1 and $3 + i$.

Solve the problem.

19) Given the polynomial function $f(x) = (x - 2)^3(x - 3)^2(x - 4)$

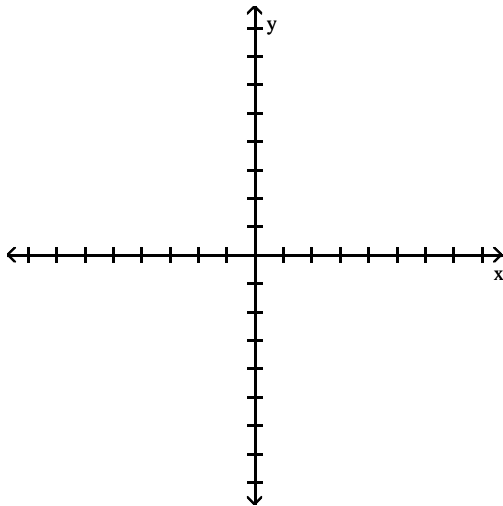
The power function is: _____

The y-intercept is: _____

In the table below, list each zero and its multiplicity.

Zero:	Multiplicity:	Touch/Cross:

Use this information to sketch a graph of the function.



Solve by hand.

20)

$$\begin{vmatrix} 5 & -4 & -1 \\ -2 & 2 & 0 \\ -1 & -2 & 8 \end{vmatrix}$$

Answer Key

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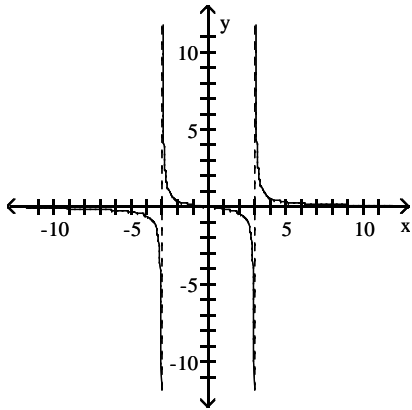
11) $f^{-1}(x) = \frac{5x + 2}{3 - x}$; domain of f : $\{x \mid x \neq -5\}$; range of f : $\{y \mid y \neq 3\}$

12) $(-\infty, -3]$ or $[0, 5]$

13) a) 5 b) $x = -4$ c) $[-4, 4]$ d) $(-4, -2) \cup (0, 2)$

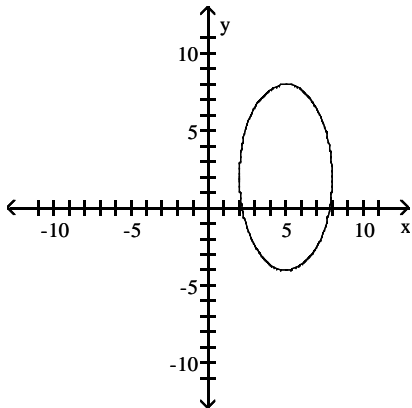
14) $\ln x + \frac{1}{7} \ln(1 + 5x) - 5 \ln(x - 7)$

15)



16) $A(x) = \frac{25}{16}x^2$

17)



$$\frac{(x - 5)^2}{9} + \frac{(y - 2)^2}{36} = 1$$

18) $f(x) = x^3 - 7x^2 + 16x - 10$

Answer Key

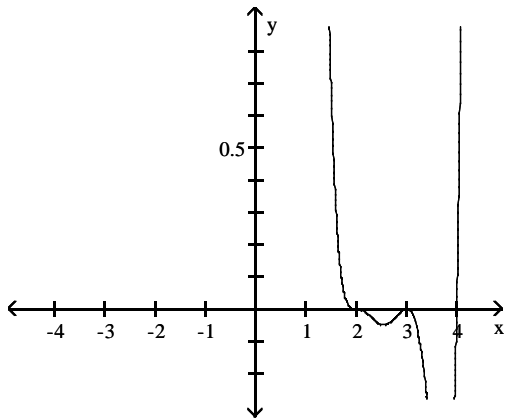
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19) The power function is: x^6

The y-intercept is: 288

In the table below, list each zero and its multiplicity.

Zero:	Multiplicity:	Touch/Cross:
2	3	Cross
3	2	Touch
4	1	Cross



20) 10